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| 10/813,886 | 03/31/2004 | Ligang Zhang | 026-0047 | 5768 |
| 22120 7590 08/31/2007 ZAGORIN O'BRIEN GRAHAM LLP 7600B NORTH CAPITAL OF TEXAS HIGHWAY SUITE 350 AUSTIN, TX 78731 | | | EXAMINER IM, JUNGHWA M | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/813,886

Applicant(s)

ZHANG ET AL.

Examiner

Junghwa M. Im

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 10-19, 23-31, 33-42, 45-51 and 53-55 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-19, 23-31, 33-42, 45-51 and 53-55 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Claim Objections

Claims 46 and 49 are objected to because of the following informalities: Claims 46 and 49 recite an identical limitation "wherein the aperture is formed in an electrically conductive plate of the electrically conductive enclosure." Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "... the electrically conductive enclosure having an aperture at least as large as the inductor," And claim 1 further recites the limitation "one or more electrically conductive links extending across the aperture." If claim 1 depicts Figure 11A, it appears that the aperture cannot be at least as large as the inductor. Note that Fig. 11A shows an aperture with the electrically conductive links is formed by innermost enclosure, therefore, it implies that the inductor is formed inside the innermost enclosure. The instant invention does not disclose this aspect. If claim 1 depicts Figure 9B, it appears that it does not show that "the electrically conductive plate is formed by a plurality of continuous conductive patterns, each of the continuous conductive patterns being substantially concentric with respect to the aperture" as

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recited in claim 1. It appears that claim 1 recites two different embodiments, Figures 9B and 11A

Claim 24 recites substantially the identical limitation to the one in claim 1 in nature.

Claim 42 recites the limitation “means for reducing current induced in the shielding means in response to the coupling means, ... wherein the means for electromagnetic shielding comprises an aperture and one or more electrically conductive links extending across the aperture.” It is confusing since it appears that the induced current is reduced by the electrically conductive links across the aperture. That is, it appears that means for reducing current induced in the shielding means and means for electromagnetic shielding are the same element.

Claim 45 recites the confusing limitation that cannot be dependant on the base claim.

The aspects regarding this matter are stated in claim 1 above.

Claims 47 and 50-51 recite the confusing limitation that cannot be dependant on the base claim. The aspects regarding this matter are stated in claim 1 above.

Claim 54 recites the confusing limitation that cannot be dependant on the base claim.

The aspects regarding this matter are stated in claim 1 above.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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Claims 23, 46, 49 and 51 are rejected under 35 U.S.C. 102(b) as being anticipated by Andrews (US 5959522).

Regarding claim 23, Fig. 2 of Andrews shows an apparatus comprising:

an inductor (140);

an electrically conductive enclosure (142) electromagnetically shielding the inductor, the electrically conductive enclosure having an aperture (156) at least as large as the inductor, the aperture being substantially centered around a projected surface of the inductor; and

one or more electrically conductive links extending across the aperture and electrically coupled to the electrically conductive enclosure,

wherein individual ones of the electrically conductive links are coupled to each other by an electrically conductive link perpendicular to the individual ones of the electrically conductive links.

Regarding claims 46 and 49, Fig. 2 of Andrews shows the aperture is formed in an electrically conductive plate.

Regarding claim 51, Fig. 2 of Andrews shows the aperture is at least as large as the inductor and is substantially centered around a projected surface of the inductor.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 53 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andrews.

Regarding claim 55, Fig. 2 of Andrews shows an apparatus comprising:

an inductor (140);

an electrically conductive enclosure (158) electromagnetically shielding the inductor, the electrically conductive enclosure having an aperture (156) at least as large as the inductor, the aperture being substantially centered around a projected surface of the inductor; and

one or more electrically conductive links extending across the aperture and electrically coupled to the electrically conductive enclosure.

Fig. 2 of Andrews shows most aspects of the instant invention except that “wherein the aperture has an approximate diameter determined by adding an approximate outer diameter of the inductor to an approximate inner diameter of the inductor.” However, it would have been obvious to one of ordinary skill in the art at the time of the invention to have the size of the aperture determined by adding an approximate outer diameter of the inductor to an approximate inner diameter of the inductor in order to accommodate the design specification, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 53, Fig. 2 of Andrews shows the aperture is formed in an electrically conductive plate.

Claims 1-7, 24-30, 42, 45, 47-48, 50 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andrews in view of Yu (US Pub. 2004/0094822).

Regarding claims 1 and 24, insofar as understood, Fig. 2 of Andrews shows an apparatus (and a method of forming the apparatus) comprising:

an inductor (140);

an electrically conductive enclosure (158) electromagnetically shielding the inductor;

the electrically conductive enclosure having an aperture (156) at least as large as the inductor, the aperture being substantially centered around a projected surface of the inductor; and

one or more electrically conductive links extending across the aperture perpendicular to each other and electrically coupled to the electrically conductive enclosure,

wherein the aperture is formed in an electrically conductive plate of the electrically conductive enclosure.

Fig. 2 of Andrews shows most aspects of the instant invention except “wherein the electrically conductive plate is formed by a plurality of continuous conductive patterns, each of the continuous conductive patterns being substantially concentric with respect to the aperture.”

Fig. 10 of Yu shows that the electrically conductive plate (33; shield) is formed by a plurality of continuous conductive patterns (24, 26), each of the continuous conductive patterns being substantially concentric with respect to the center.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Yu into the device of Andrews in order to have the electrically conductive plate formed by a plurality of continuous conductive patterns, each of the continuous conductive patterns being substantially concentric with respect to the aperture for the reduction of the noise.

Regarding claims 2 and 25, Fig. 2 of Andrews shows the aperture is substantially parallel to a plane of current flow in the inductor.

Regarding claims 3 and 26, the combination of Andrews/Yu does not show the aperture has an approximate diameter determined by adding an approximate outer diameter of the inductor to an approximate inner diameter of the inductor since the aperture of Andrews is formed outside of the spiral inductor. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to have the size of the aperture determined by adding an approximate outer diameter of the inductor to an approximate inner diameter of the inductor in order to accommodate the design specification, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 4 and 27, the combination of Andrews/U would show the electrically conductive links reduce an effect of electromagnetic signals external to the electrically conductive enclosure on the inductor since the device of the combination of Andrews/Yu would have substantially the similar structure to the one recited in the instant invention.

Regarding claims 5 and 28, the combination of Andrews/Yu fails to show the electrically conductive links reduce coupling in the inductor from external sources by approximately 6dB. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to have the electrically conductive links reducing the coupling in the inductor from external sources by approximately 6dB in order to accommodate the circuit parameters, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

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Regarding claims 6 and 29, the combination of Andrews/Yu fails to show the electrically conductive links are approximately 5 μm wide. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to have the electrically conductive links are approximately 5 μm wide to meet the required specification, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 7 and 30, Fig. 2 of Andrews the electrically conductive links are formed in the one or more traditional integrated circuit layers.

Regarding claim 48, Fig. 2 of Andrews shows individual ones of the electrically conductive links are coupled to each other by an electrically conductive link perpendicular to the individual ones of the electrically conductive links.

Regarding claims 47 and 50, Fig. 2 of Andrews shows most aspects of the instant invention except “wherein the electrically conductive plate is formed by a plurality of continuous conductive patterns, each of the continuous conductive patterns being substantially concentric with respect to the aperture.” Fig. 10 of Yu shows that the electrically conductive plate (33; shield) is formed by a plurality of continuous conductive patterns (24, 26), each of the continuous conductive patterns being substantially concentric with respect to the center.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Yu into the device of Andrews in order to have the electrically conductive plate formed by a plurality of continuous conductive patterns, each of the

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continuous conductive patterns being substantially concentric with respect to the aperture for the reduction of the noise.

Regarding claim 42, insofar as understood, Fig. 2 of Andrews shows an apparatus comprising:

means for electrically coupling nodes of an integrated circuit (140; an inductor);
means for electromagnetically shielding the coupling means (142); and
means for reducing current induced in the shielding means in response to the coupling means (158), the induced current generating an electromagnetic field counteracting an electromagnetic field generated by the coupling means,

wherein the means for electromagnetic shielding comprises an aperture (156), and one or more electrically conductive links extending across the aperture:

wherein the aperture is formed in an electrically conductive plate of the means for electromagnetically shielding.

Fig. 2 of Andrews shows most aspects of the instant invention except “wherein the electrically conductive plate is formed by a plurality of continuous conductive patterns, each of the continuous conductive patterns being substantially concentric with respect to the aperture.”

Fig. 10 of Yu shows that the electrically conductive plate (33; shield) is formed by a plurality of continuous conductive patterns (24, 26), each of the continuous conductive patterns being substantially concentric with respect to the center.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Yu into the device of Andrews in order to have the

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electrically conductive plate formed by a plurality of continuous conductive patterns, each of the continuous conductive patterns being substantially concentric with respect to the aperture for the reduction of the noise.

Regarding claim 45, Fig. 2 of Andrews shows the aperture is at least as large as the means for electrically coupling and is substantially centered around a projected surface of the means for electrically coupling.

Regarding claim 54, Fig. 2 of Andrews shows most aspects of the instant invention except "wherein the electrically conductive plate is formed by a plurality of continuous conductive patterns, each of the continuous conductive patterns being substantially concentric with respect to the aperture." Fig. 10 of Yu shows that the electrically conductive plate (33; shield) is formed by a plurality of continuous conductive patterns (24, 26), each of the continuous conductive patterns being substantially concentric with respect to the center.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Yu into the device of Andrews in order to have the electrically conductive plate formed by a plurality of continuous conductive patterns, each of the continuous conductive patterns being substantially concentric with respect to the aperture for the reduction of the noise.

Claims 8, 10-19, 31 and 33-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andrews in view of Yu as applied to claim 1 above, and further in view of Gomez et al., (US 6847282), hereinafter Gomez.

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Regarding claims 8 and 31, the combination of Andrews/Yu fails to show that the electrically conductive enclosure includes a top plate, a bottom plate, and sidewalls. Fig. 5 of Gomez shows the electrically conductive enclosure includes a top plate, a bottom plate, and sidewalls (col. 8, lines 5-19).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Gomez into the device of Andrews/Yu in order to have the electrically conductive enclosure includes a top plate, a bottom plate, and sidewalls to enhance the shielding,

Regarding claims 10 and 33, Fig. 2 of Andrews shows the aperture is formed in the bottom plate.

Regarding claims 11 and 34, Fig. 6B of Gomez shows the bottom plate is formed in one or more integrated circuit metal layers that are formed on the integrated circuit die.

Regarding claims 12 and 35, Fig. 5 of Gomez shows the top plate is formed in a metal layer formed on the integrated circuit die.

Regarding claims 13 and 36, Gomez discloses the top plate/metal layer is formed in a redistribution layer that are formed on the integrated circuit die (col. 3, lines 28-38).

Regarding claims 14 and 37, Gomez discloses that the top plate is formed in a package substrate (col. 3, lines 28-38).

Regarding claims 15 and 38, the combination of Andrews/Yu fails to show that “the inductor is formed at least partially in one or more metal layers of an integrated circuit die thicker than others of the metal layers.” Fig. 7 of Gomez shows that the inductor (of the

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connecting portions) is formed at least partially in one or more metal layers of an integrated circuit die thicker than others of the metal layers.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Gomez into the device of Andrews/Yu in order to have the inductor formed at least partially in one or more metal layers of an integrated circuit die thicker than others of the metal layers to increase the electrical coupling.

Regarding claims 16, 17 and 39, the combination of Andrews/Yu fails to show that the inductor is formed at least partially in one or more redistribution layers formed on an integrated circuit die. Gomez discloses that the inductor is formed at least partially in one or more redistribution layers formed on an integrated circuit die (col. 3, lines 28-38).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Gomez into the device of Andrews/Yu in order to have the inductor being formed at least partially in one or more redistribution layers formed on an integrated circuit die for signal routing.

Regarding claims 18 and 40, the combination of Andrews/Yu/Gomez fails to show a conductor forming the inductor is 10 um wide. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to have a conductor forming the inductor is 10 um wide to accommodate the required specification, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

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Regarding claims 19 and 41, the combination of Andrews/Yu/Gomez fails to show the aperture and the inductor are effectively spaced at least 10.25 μm apart. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to have the aperture and the inductor are effectively spaced at least 10.25 μm apart in order to accommodate the required specification, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Response to Arguments

Applicant's arguments with respect to pending claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment filed December 13, 2006 necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period


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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Junghwa M. Im whose telephone number is (571) 272-1655. The examiner can normally be reached on MON.-FRI. 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne A. Gurley can be reached on (571) 272-1670. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Junghwa M. Im
Examiner
Art Unit 2811

jmi
8/28/2007